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ARLINGTON, VA

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A MODERN BUS RAPID TRANSIT (BRT) SYSTEM IS FAR SUPERIOR TO STREETCARS IN THE COLUMBIA PIKE CORRIDOR

Background and Acknowledgments

I am solely responsible for the contents and factual accuracy of this report. A summary of my professional background, together with my civic and political activities as a resident of Arlington, Virginia, appears immediately following Appendix A to this report.

In preparing this report, I want to acknowledge the professional transportation advice and expertise of **Sam Zimmerman**, also an Arlington resident and **transportation consultant to the World Bank**. Sam's biography appears immediately following my own in this report.

I further want to acknowledge the professional transportation advice and expertise of **Robert Dunphy**, another Arlington resident. Bob is a **transportation consultant and an instructor at Georgetown University**. Bob's own separate report appears as Appendix B to this one. Bob's biography appears at the conclusion of his report.

Introduction and Summary

From a transit perspective, a modern BRT system is clearly superior to streetcars in the Columbia Pike corridor. A modern BRT system could much more quickly be expanded to serve many more origins and destinations than those served by the currently-proposed, 5-mile streetcar system. Such an expanded BRT system would not require as many time-consuming transfers between transit modes. It would boost ridership and create a more economically efficient system.

Moreover, since a modern BRT system will cost anywhere from one half to one fifth as much as the streetcar, a modern BRT system is the hands down winner in the thorough cost-benefit comparison that the Arlington County Board has not yet performed, but must perform before it makes a final decision on which of these two options actually should be funded.

Even though the Columbia Pike streetcar proposal has been considered in one form or another for many years, the County Board has never had before it a proper cost-benefit comparison between the current streetcar proposal and a modern BRT system. Because such a proper cost-benefit comparison has never been performed, our many Arlington citizens groups and individual citizen activists have never had the opportunity to weigh in regarding such a comparison. The "Arlington Way" has not been followed with respect to the streetcar issue. The appropriate critical studies have not been done. Neither Arlington citizens nor Arlington businesses—which must pay for the streetcar—have been informed of the options available for the transit system they will fund.

A proper cost-benefit comparison is vital because Arlington faces a huge number of competing demands on its budget—for schools, affordable housing, public safety, County employee pay and benefits, mental health services, other social safety net services, road maintenance, and other core public services.

Since as much as \$100 million can be freed up to fund these other critical needs if Arlington chooses a modern BRT system instead of the streetcar, the Arlington community generally—and all progressive Democrats in particular—have a duty to examine thoroughly the comparative costs and benefits of these two alternative types of transit systems, and to provide the County Board with their views, before the County Board reaches a final decision.

From a transit perspective, a modern BRT system is the best choice in the Columbia Pike corridor

What is a modern BRT system and why would it provide transit service clearly superior to the streetcar in the Columbia Pike corridor?

For an excellent overview of what a modern BRT system is and what it can do, please take a few moments to review this video of the BRT system proposed for Eugene, Oregon:

<http://www.youtube.com/watch?v=ia3W6RBAJxY>

And, this is a photo of a BRT vehicle proposed for Eugene:



More specifically, BRT:

- is a permanent, integrated **system** — not just another bus or bus route;
- can provide the same service frequency and span (time of day, days of week) service as the streetcar;
- service would be more tailored to the market; e.g., it would provide a new express route which would be significantly faster than today's bus service because it would have fewer stops, signal priority, and no-step, no gap boarding/alighting;
- could have the same type of permanent stations as the streetcar, same look and amenities in the same locations as the streetcar;
- would utilize high capacity, natural gas or hybrid diesel electric vehicles with low noise and emissions of all kinds; unlike the streetcar, no unsightly overhead wires would be required;
- would feature off board fare collection and level, no-gap boarding/alighting like all full- featured BRT systems, facilitating use by all citizens irrespective of age or physical disability, and reducing stop times at stations;
- would provide faster and more reliable speeds than streetcars because of the ability to go around stopped and/or turning cars and trucks. With the streetcar, this picture from Toronto, Canada shows the risk you run at any time:



Finally, a modern BRT system could much more quickly be expanded to serve many more origins and destinations than those served by the currently-proposed, 5-mile streetcar system. The very limited origins and destinations served by that system are on the system map that appears here:

<http://sites.arlingtonva.us/streetcar/projected-streetcar-route-map/>

Working together, Fairfax, Arlington, and Alexandria could create an inter-connected modern BRT system running all the way down to Ft. Belvoir along Route 1 and down Columbia Pike past Skyline to NOVA, BRAC on Seminary Road and Landmark, and then down Duke Street to the King Street Metro stop

on the other end. (In the future, a similar modern BRT service could be provided in the Lee Highway corridor and on Route 7 to the East Falls Church Metro.)

Alexandria is beginning to plan for a BRT system in the Route 1 and Beauregard corridors, and Arlington should work jointly with Alexandria to create a seamless modern BRT system for both the Columbia Pike and Route 1 corridors. Such cooperative planning will avoid the delays associated with having to change transit modes between an Arlington streetcar and an Alexandria BRT system. This will lead to higher ridership on both the Arlington and Alexandria portions of such an integrated BRT system, producing significantly better economic results on both the Arlington and Alexandria portions of that system.

Fairfax currently has a BRT program in the Route 1 corridor. That program terminates at the King Street Metro. Clearly, it would make much more sense to continue that BRT line to the Pentagon and seamlessly connect two major military facilities. Although currently in a very early conceptual stage, Fairfax also is beginning to examine the prospects of much expanded BRT service throughout Fairfax County. Fairfax believes there will be great demand for these BRT services in the future. Although it will be some years before these BRT plans become more concrete, it is certainly reasonable to believe that one of Fairfax's future BRT routes will interchange at Skyline. Therefore, if it were decided to install a modern BRT system instead streetcars along Columbia Pike, that Columbia Pike BRT service could seamlessly continue on to other points in Fairfax County beyond Skyline.

The Arlington County website currently displays a series of objectives in the Columbia Pike corridor which that website says the streetcar could meet: <http://sites.arlingtonva.us/streetcar/why-streetcars/> Appendix A to this report contains a table which, in the left-hand column, displays each of those objectives and, in the right-hand column, summarizes the ways in which a modern BRT system will meet or exceed all of the same objectives as the streetcar—but at a fraction of the cost.

Moreover, Appendix B to this report contains a detailed comparison of the current Columbia Pike streetcar proposal with the alternative of premium bus service along Columbia Pike. That comparison, prepared by independent transportation consultant Bob Dunphy, reaches the same conclusion as I have with respect to the superiority of a modern BRT system once the relative costs are taken into account.

For all of the above reasons, a modern BRT system in the Columbia Pike corridor is a much smarter mass transit solution for Arlington and the Northern Virginia region than the current streetcar proposal.

When the costs of the two alternatives are factored in, BRT beats the streetcar hands down

There is a lot of experience nationally, and in the Metropolitan Washington region, which provides a helpful guide to what the costs of a modern BRT system are likely to be. For example, our neighbor, Montgomery County concluded:

“With the inability to expand the roadway system and an increasing population, alternative transportation methods need to be considered. Ideally, we would like to add more rail lines but at \$300 - \$400 million per mile for heavy rail like Metro and \$50 - \$100 million per mile [for] light rail, we cannot afford to build much of a next generation public transportation system. At \$10 - \$25 million per mile, bus rapid transit (BRT) is less expensive and allows for more interconnecting routes.”

http://www6.montgomerycountymd.gov/elrtmpl.asp?url=/content/council/mem/elrich_m/brt.asp

The most recent report on the estimated costs of the Columbia Pike streetcar, approved by the Arlington County Board on July 21, 2012, contained the following pertinent information about the then-estimated capital costs of the streetcar project:

“FISCAL IMPACT: The current capital cost estimate for the streetcar alternative is \$221 million (2011 dollars), including all design, construction, facilities and equipment, and a contingency of 18%. Escalated to a mid-year of construction (2015), the cost estimate would be \$249 million. Arlington’s share of the capital cost is approximately 80% or \$199 million. The current funding plan includes a federal grant of \$75 million under the New Starts/Small Starts program, of which \$60 million is attributable to Arlington’s share of the capital cost. Arlington’s proposed Capital Improvement Program fully funds its remaining \$139 million share of the project capital cost with funding from the Transportation Capital Fund, revenue bonds financed by that fund, and reimbursement funds from the Commonwealth of Virginia.” [p.7]

http://arlington.granicus.com/MetaViewer.php?meta_id=101566&view=&showpdf=1

As regards the then-estimated annual operating costs, this same report continued:

“The annual operating cost for the streetcar is approximately \$8.9 million. Fares are projected to be comparable to bus fares and revenue is projected to be \$2.5 M (29% fare box recovery). The Pike Ride service, including the ART routes along Columbia Pike, achieves at least this rate of fare box recovery. Arlington’s share of the net operating cost of \$6.4 million is 80% or \$5.1 million. The Commonwealth of Virginia will reimburse local expenditures for operating cost at an assumed rate of 30% or \$1.5 million, leaving a local net cost of \$3.6 million. The funding source for operating costs will be identified and finalized as the project is being completed.” [pp. 7-8]

We examine these estimated capital and operating costs further below.

Capital Costs

One of the greatest concerns about these latest Arlington County Board capital cost estimates is that these costs have soared by more than 55% from the \$161 million estimated just five years ago to the \$250 million estimated in July 2012. <http://www.arlnow.com/2011/12/02/developing-pike-streetcar-cost-soars/> Obviously, the cost of a modern BRT system is also subject to cost escalation, but since the total project cost of a modern BRT system is likely to be anywhere from one half to one fifth as much as the total project cost of the streetcar, the base-level cost differential between the two systems is enormous regardless of how fast the costs of either system escalate.

Table 1 below compares these total project costs using three alternative assumptions regarding those costs and assuming that any modern BRT system Arlington ultimately selected will end up costing one third as much as the streetcar:

TABLE 1—TOTAL PROJECT COSTS-STREETCAR VS. BRT SYSTEM

Streetcar Total Project Cost (\$’s millions)	BRT Total Project Cost (\$’s millions; = 1/3 rd of streetcar)	Savings By Choosing BRT System (\$’s millions) (col. 1 – col. 2)
250.00 [July 2012 est.]	83.33	166.67
300.00 [20% cost escalation]	100.00	200.00
350.00 [40% cost escalation]	116.67	233.33

In its latest capital improvement plan, Arlington is proposing to set aside \$199 million to pay for its share of the total capital costs of the streetcar project, while assuming that Fairfax County will pay for the balance. The full CIP can be reviewed here: <http://www.arlingtonva.us/departments/ManagementAndFinance/documents/file86427.pdf> , and the Columbia Pike streetcar funding assumptions are in Appendix E, pp. 24-25, of this CIP.

Arlington is hoping that the federal government will provide a \$75 million grant for this project under the New Starts/Small Starts program. That program authorizes the federal government to pay for 30% of qualifying streetcar projects up to a dollar maximum of \$75 million—a maximum that the Columbia Pike streetcar project has already reached.

However, the New Starts/Small Starts program also authorizes the federal government to pay for up to 30% of the costs of qualifying BRT projects: http://www.nbrti.org/docs/ppt/Michigan_workshop/3_FTA%5B1%5D.pdf Since BRT projects are likely to cost between one half to one fifth as much as streetcar projects, a much more extensive modern BRT system—serving many more origins and destinations—could be implemented with \$75 million in federal funding.

Arlington is also hoping that the state of Virginia will pay for 14% of the total capital costs of this streetcar project, or \$35 million under current estimates. If Virginia would be willing to pay \$35 million toward the cost of the Columbia Pike streetcar, Virginia should be willing to pay the same \$35 million for a well-designed modern BRT system. But, the \$35 million from Virginia would buy a much more extensive and flexible BRT system than the currently proposed streetcar system.

If Arlington can convince the federal government, the Virginia government, and the Fairfax County government to pay these dollar amounts for the currently-estimated total capital costs of the streetcar project, a recent story in the Washington Post concluded, “In all, the breakdown means Arlington will be on the hook for about \$110 million county staff members said.” [Arlington board backs Columbia Pike streetcar, p. B5 of the July 25, 2012 print edition of the WaPo.]

Another way to look at this is shown in Table 2 below. Table 2 displays Arlington’s potential savings from choosing a modern BRT system instead of a streetcar in the Columbia Pike corridor—assuming five alternative estimates for Arlington’s share of the total project cost, and further assuming that any BRT system Arlington selected would cost one third as much as the streetcar:

TABLE 2—ARLINGTON SHARE OF PROJECT COSTS—STREETCAR VS. BRT SYSTEM

Streetcar: Arlington’s Cost Share (\$’s millions)	BRT: Arlington’s Cost Share (\$’s millions; = 1/3 rd of streetcar)	Savings By Choosing BRT System (\$’s millions) (col. 1 – col. 2)
110.00 [July 2012 est.]	36.67	73.33
150.00 [36% cost escalation]	50.00	100.00
180.00 [64% cost escalation]	60.00	120.00
220.00 [100% cost escalation]	73.33	146.67
250.00 [127% cost escalation]	83.33	166.67

Operating Costs

Part of the total annual operating costs of both the streetcar and of any alternative BRT system would be covered by passenger fares. The latest CIP assumes that Arlington would have to pay a subsidy of \$3.6 million per year to cover the shortfall between the total operating costs of the Columbia Pike streetcar and the passenger fares it would generate. See CIP Appendix E, p.6.

But, the annual operating costs for the streetcar will be higher than those for a BRT system. In his separate report in Appendix B, Bob Dunphy concludes, “the operating and maintenance costs of the streetcar are also higher, ranging from \$3 million more annually in 2011 dollars, up to \$7 million annually in 2016 dollars.” [Appendix B, p. 18]

Return on Investment (ROI)

In July 2012, the Arlington County Board reviewed a Return on Investment (ROI) study which made a number of claims regarding the positive impacts on economic development along the Columbia Pike Corridor. That study concluded that those positive development impacts would result from the construction and operation of the Columbia Pike streetcar. This Arlington ROI study may be accessed here: http://www.piketransit.com/downloads/may2012/ROI_July_2012_July_16_2012.pdf

The single most important thing to be said about Arlington’s ROI study is that no comparable study was ever done comparing the potential positive impacts of the streetcar on economic development with the potential positive impacts of a modern BRT system on economic development.

Based on experience in a number of other cities, including Cleveland, Ohio, a thorough comparison between the positive economic development impacts of these two alternative types of mass transit systems might show that there is likely to be little or no difference between the positive economic development effects of the streetcar vs. those of a modern BRT system. For more on BRT’s positive economic development effects in Cleveland, please review:

<http://urbanland.uli.org/Articles/2012/July/HellendrungHealthLine>

Moreover, we believe that Arlington’s streetcar ROI study mistakenly concluded that the presence of streetcar service along Columbia Pike could be separately quantified. Attributing future economic development along Columbia Pike to the streetcar alone is highly speculative, and therefore does not deserve much, if any, weight.

For the above reasons, there is no reason to conclude that the streetcar project, standing alone, would generate any particular amount of incremental tax revenue. (It may turn out that the same speculative problems will present themselves when trying to isolate the positive impacts on economic development of a modern BRT system, but since Arlington never performed an ROI study for a modern BRT system, Arlingtonians presently have no way to tell whether either system is superior to the other from an ROI standpoint—although the worst elements of a streetcar project, such as the substantially greater traffic disruptions and delays and a canopy of power lines—would not apply to a BRT system.

Supporters of the Columbia Pike streetcar often have cited the case of the streetcar service in Portland, Oregon as “proving” that a streetcar along Columbia Pike will, standing alone, generate economic development (and therefore local tax revenues). These streetcar supporters go on to argue that these incremental tax revenues will help pay for the huge costs of the Columbia Pike streetcar project. In this respect the Portland streetcar experience does not support what the supporters of the Columbia Pike streetcar claim.

The Portland streetcar line did not, by itself, generate economic development, but was instead part of a large-scale economic development plan that generated economic development. Independent experts confirm the foregoing interpretation of the Portland experience. In this regard, I would like to acknowledge the work of Richard Stock, Ph. D., a member of the Business Research Group at the University of Dayton. In an unpublished paper (prepared for a client and made available to me) entitled, ***“A Review of Streetcar Economics by Appeal to Existing Systems with a Few Thoughts on The Implications for Dayton”***, Dr. Stock presented these conclusions about Portland:

“Implicit in the lessons learned is that the true public policy piece was a long term effort to revitalize a large acreage area near downtown using the instruments available with a declared urban renewal district. Those with a more critical eye have noted that almost all of the development took place in urban renewal districts where substantial additional public funds were made available to get the land ready for development. **It is inappropriate to ignore the public cost of making the land developable by private developers ***.**

“The critical point is that Portland is not a story of a streetcar line that precipitated economic development but the story of a development deal created by a public-private partnership that had a streetcar line as an important piece of the plan.” [Emphasis added]

More generally, Dr. Stock had this to say about the theory that streetcars, standing alone, can have a quantifiable effect on economic development:

“There is almost no economic literature that looks at the modern streetcar systems. This occurs primarily because they have been in existence a relatively short time. Therefore, most appeals to the economic development argument are of two types. The first does a simple aggregation of the amount of capital investment in residential and commercial space that has occurred within a 1 to 3 block buffer of the streetcar corridors and suggests that it is closely linked to the streetcar project ***. The second approach is slightly more sophisticated. Investment in the streetcar corridor area is compared to some other portion of the region and the differential rate of growth in the streetcar zone is noted. **In both cases, proponents typically acknowledge the weakness of the approach and do the calculations anyway**”. [Emphasis added]

Moreover, Arlington’s streetcar ROI study failed to consider two highly negative impacts from a streetcar project on the Columbia Pike corridor:

Construction and Traffic Delays to Last Many Years. Construction associated with the streetcar would occur at the rate of two months per block. This means that to complete the construction along all 40 blocks in the Columbia Pike corridor would take 80 months—6 to 7 years.

New Canopy of Power Lines. After great effort and expense to underground power lines, Columbia Pike would receive a new, unsightly canopy of power lines and supporting structures that would ruin views all along the Columbia Pike corridor.

Finally, there is a staggering \$123,000 difference between the incremental cost per each additional rider as between the current streetcar proposal and a modern BRT system. As Bob Dunphy explains, “The capital cost of the TSM2 option per additional rider, *over and above those expected in the base case*, comes to about \$1800 by 2030. The streetcar option would cost almost \$200 million more, but carry only an additional 1,600 daily riders, a staggering investment of \$123,000 for each new rider.” [Appendix B, p. 18; and see in particular the bar graph comparisons in the chart at the bottom of that page entitled, “Capital cost/added rider ~ 2030”]

Conclusion

A modern BRT system is far superior to the streetcar in the Columbia Pike corridor because a modern BRT system will:

- achieve all the objectives in that corridor better than, or as well as, the streetcar (Appendix A)
- cost only one fifth to one half as much as the streetcar (Tables 1 & 2)
- rapidly and economically help develop a much-needed regional transit system when coordinated with Fairfax and Alexandria, and possibly Falls Church
- contribute to the vision for redevelopment of Columbia Pike (Appendix B)

Moreover, by making a final decision to purchase a modern BRT system instead of the streetcar, the Arlington County Board could free up as much as \$100 million (Table 2) to spend on other critical Arlington public projects and services that desperately need more funding.

Here are just a few illustrative examples of such other critical Arlington public projects and services:

Public Education:

- help fund school construction to relieve overcrowding
- keep class sizes as small as possible
- reduce the “achievement gap” by adding targeted reading and math specialists and expanding pre-K classes

Public Employee Compensation:

- recruit and retain even higher quality staff—for both the County and the Schools—by providing the most competitive possible salary and benefits packages

Affordable Housing:

- Enhance the number of Arlington fire fighters, police, and teachers who live in Arlington
- Prevent even more members of our immigrant community and others from being forced to leave Arlington

Social Safety Net:

- Provide more benefits to the most vulnerable in our community, such as the elderly or disabled

Maintenance Capital

CIP Working Group, Nov. 4, 2011:

<http://www.arlingtonva.us/departments/ManagementAndFinance/CapitalImprovementProgram/CIPWG%20Presentation%2011.4.11.pdf>

- Roads & Sidewalks
- Water & Sewer

The above list of examples is by no means comprehensive.

The Arlington community has not:

- been offered a proper cost-benefit analysis of the streetcar vs. a modern BRT system, nor does our community understand what a modern BRT system is and could be,
- been provided with any analysis of the return on investment (ROI) for a modern BRT system nor how such a BRT ROI would compare with the ROI claimed for the streetcar,
- focused on the huge dollar savings (as much as \$100 million) that Arlington could realize by choosing a modern BRT system instead of the streetcar,
- had a thorough community conversation about the major benefits that our community could derive by reallocating some, most, or all of the savings from choosing a modern BRT system into other Arlington public programs and services like those noted above, or others.

In these circumstances, the Arlington County Board ought to take the lead by:

- authorizing totally independent experts to prepare a proper cost benefit comparison between a modern BRT system and the streetcar,
- authorizing totally independent experts to prepare a proper comparison between the expected ROI of a modern BRT system and the expected ROI of the streetcar,
- engaging our Arlington community in a fully informed and participatory conversation about which of these two alternative transit systems is best for our community,
- focusing that conversation on the other Arlington public projects and services that could be funded if a modern BRT system is chosen instead of the streetcar.

Respectfully submitted,

Peter Rousselot

APPENDIX A

Table A-1: Arlington’s Columbia Pike Objectives—Streetcar vs. BRT

Why Streetcar? http://sites.arlingtonva.us/streetcar/why-streetcars/	Why BRT?
Streetcars help create vibrant urban places with a high quality of life—and less traffic congestion.	BRT systems help create vibrant urban places with a high quality of life—and less traffic congestion.
They can move more people than buses.	They can move more people than buses.
They cost less to build than expensive subways or even light rail.	They cost far less to build than expensive streetcar systems.
They stop more frequently, offering riders greater mobility.	They can stop more frequently, less frequently, or just as frequently as streetcars.
Their electric motors and steel tracks offer a quiet, comfortable ride that encourages more folks to use transit.	Sleek, modern BRT systems also offer a quiet, comfortable ride that encourages more folks to use transit.
If sufficient transit is in place, by 2040 Arlington can expect 110-120 million annual transit trips beginning in or ending in Arlington. The streetcar will serve parts of Arlington that are projected to add 37,000 jobs, 21,000 residents, 11,600+ housing units between 2010 and 2040. That is an expected 58% increase in jobs and a 39% increase in residents. Arlington’s existing Metrorail, VRE and regional/local bus services and facilities cannot meet the transit capacity challenges we face. Streetcars will fill a transit gap for those who live or work in Arlington.	Since a BRT system is so much cheaper to put in place, it can much more easily adjust to the actual, as opposed to the projected, increases in jobs and residents at the many more origins and destinations a BRT system will be able to serve. For these reasons, a BRT system will fit much more flexibly than the streetcar into the gaps that Arlington’s existing Metrorail, VRE and regional/local bus services and facilities will not be able to serve. BRT will be more effective than a streetcar in filling any transit gap for those who live or work in Arlington.
By reducing the number of cars on the road, they contribute to environmental sustainability.	Because BRT systems will be able to serve many more origins and destinations than the streetcar, BRT will reduce as many or more cars on the road as a streetcar could.
Cities that have built modern streetcar systems have seen an upsurge in private investment in the neighborhoods served.	Cities like Cleveland, Ohio that have built modern BRT systems also have seen an upsurge in private investment in the neighborhoods served.

PETER ROUSSELOT—BACKGROUND SUMMARY

BA, Summa Cum Laude, Yale University; JD, Harvard Law School

Peter was affiliated with the Washington, DC law firm of Hogan & Hartson (now known as Hogan Lovells) for 28 years (1966-1974 associate; 1975-1994 partner). While with that law firm,

- Peter represented the private owner/operator of the DC Transit bus company when it was acquired by WMATA in the early 1970's. The principal issue in the case was how to value the buses, garages, real estate, and other tangible and intangible assets of the company.
- Peter represented a specially-created federal agency, the United States Railway Association (USRA), in the acquisition and restructuring of 7 major freight railroads in the Northeast and Midwest United States (including the Penn Central), from 1975 to 1980. The principal issue in the case was how to value the locomotives, rolling stock, bridges, track, other real estate, and tangible and intangible assets of these 7 companies. The major real estate valuation issue in the case was the extent to which it was or was not appropriate to consider the potential for economic development in determining an appropriate fair market value for real estate adjacent to the rights of way owned by the railroads.
- Peter represented a group of Wall Street investors in the reorganization and sale of a freight railroad holding company, the Chicago Milwaukee Corporation, in the mid-1980's. The issues in the case were similar to those involved in the USRA representation.

After leaving Hogan in 1994, Peter was Managing Director in the Washington office of Union Pacific Railroad for 3 years (1994-1997). During that time,

- Peter headed a project team for the principal investor in the Union Pacific Railroad Company determining whether to bid on a portion of the FNM rail system in Mexico during its privatization.

After leaving Union Pacific in 1997, as an independent transportation consultant,

- Peter headed a project team advising a passenger rail car repair facility in St. Petersburg, Russia, regarding how to restructure the company to make it attractive to private investors.

From 2000 to 2006, Peter served on the Fiscal Affairs Advisory Commission (FAAC) to the Arlington County Board, and was Chair of FAAC from 2004 to 2006.

From 2006 to 2010, Peter served as Chair of the Arlington County Democratic Committee (ACDC).

Sam Zimmerman, Urban Transport Consultant to World Bank

Bachelor's Civil Engineering, MCE, Cornell University

Sam Zimmerman's over 40 year career has focused on public transport planning, in particular on rapid transit, economic appraisal, financial planning, network analysis and travel demand forecasting. He retired from the World Bank as Senior Urban Transport Specialist in 2009 but continues as an urban transport consultant. At the Bank, he served as the central transport unit's urban transport advisor, providing policy and technical advice to Bank, central government and other officials world-wide. He has spent significant time supporting the Bank's managers of investment, technical assistance and other projects for cities in China, India, Vietnam and the Philippines. He was and remains one of the lead developer/presenters for the Bank's extensive urban transport capacity building program. The program supports professional development through the provision of self-learning materials, mentoring, peer exchanges, seminars and workshops.

Mr. Zimmerman previously was an originator of the National Transit Institute's BRT capacity building program and project manager for the preparation of the U.S. Transportation Research Board's BRT Implementation Guidelines.

Mr. Zimmerman had 28 years' of service with USDOT, including nine as the Federal Transit Administration (FTA)'s Director of Planning. In that capacity he directed FTA's activities in multi-modal metropolitan transportation planning, environmental planning and assessment and major public transport investment planning and appraisal.

He has written numerous articles and papers and was an adjunct faculty member at 3 Washington-area universities (Howard University, University of Maryland and George Washington University) over a twenty year university teaching career.

APPENDIX B

Premium Bus or Streetcar: An Evaluation of the Columbia Pike Transit Proposal **Robert T. Dunphy**

Summary

The proposed streetcar on Columbia Pike and the premium bus improvement it was compared with would both result in significant improvements over today's service, supporting the vision of redeveloping the corridor with high-quality, mixed use development, as a more walkable, bikeable, transit-oriented Main Street. It appears that either alternative can deliver the needed transit expansion and either alternative can support the redevelopment vision. Relatively small transit improvements are projected from the streetcar option; 5% more capacity, 4% more ridership, and 3% further reduction in travel times. The premium bus option can do so for a fraction of the cost, with lower operating costs. The streetcar option would carry 1,600 more daily riders at an additional cost of \$123,000 each. Moreover, the premium bus option can be implemented more quickly, and without having to deal with federal regulations. A side benefit is that such an alternative could connect with proposed BRT projects in Fairfax and Alexandria, improving access to and from the Columbia Pike corridor, and making it even more attractive for new development.

Better Transit Options to Support the Columbia Pike Vision

The vision adopted by governments in both Arlington and Fairfax calls for transforming a neglected, in some places, deteriorating, auto-oriented corridor to a pedestrian- and transit-oriented corridor, a "Main Street," with small activity nodes with mixed-use centers. This transformation will be similar to that proposed for Rockville Pike in Montgomery County and Tyson's Corner in Fairfax County, as well as Arlington's own Rosslyn-Ballston Corridor, a nationally recognized success story of over 30 years of smart growth. Supporting such a community transformation requires the transit basics needed to handle the growth in ridership as well as the "wow factor" needed to gain the support of skeptical developers and retailers, that this will be a sexy new transit service rather than just the lowly bus serving users without options.

What are the transit alternatives considered?

Two significant improvements have been proposed and compared; a streetcar operating in mixed traffic, and a vastly improved premium bus system (described by the unfortunately arcane acronym of TSM2). A streetcar sounds sexy and hip, to attract the new clientele to which the Columbia Pike plans appeal, although it will operate in mixed traffic just as the bus will. The TSM2, (pronounced teasem' too?) sounds wonky and tedious, but represents a new high tech, high touch generation of transit unknown today in the Washington area. Described elsewhere – and in previous studies for this corridor – as Bus Rapid Transit technology (BRT), it is intended to capture the attention of a younger generation looking for something cooler than

a bus, with a unique branding and look, smart card fares, computerized communications to give preference at signals, and attractive waiting areas. Both of these two options will deliver the transportation basics equally, with: ¹



- Larger vehicles. Both options call for continuing the extremely high frequencies of today's transit service - a vehicle arriving about every 2-3 minutes - but both the BRT and streetcar options would substitute larger vehicles for 10 standard buses, using articulated buses and streetcars, respectively. So actually, the streetcar alternative is really a "streetcar-flavored", mostly bus alternative. Such a strategy is a more economical way to add capacity than adding additional trips.
- Expedited fare collection and consolidation of stops – Both options would include an off board fare collection system to allow using all doors, speeding up boarding. Both would also consolidate stops to between ¼ mile and ½ a mile, further reducing time spent boarding. Rather than stop every 1/8th of a mile as today's buses do, stops would be
- Enhanced stops – Passenger amenities would include more attractive shelters and passenger information, including real time arrivals reports at some stations, and longer boarding areas for multiple vehicles. **[See rendering of Arlington Super Stop above.]**
- Preferential Transit– Intelligent signals would give priority to transit vehicles.

Comparing the transit options on the more subjective "sexy" quota is more subjective, but both are clearly a substantial advance over today's crowded buses.

How do the two alternatives perform?

The performance of the two options on the "basic transportation" measures is quite similar. The TSM 2 alternative expands transit capacity by 1/3 with more and longer buses, compared to the base case, reduces the travel time from end to end by three minutes, and improves reliability, the degree of bunching, from today's levels. Ridership growth forecast is even greater, 67% by 2016, and 93% by 2030, an extraordinary expansion. Relatively small additional improvements are projected from the streetcar option; 5% more capacity, 4% more ridership, and 3% further reduction in travel times. There is also a modest improvement in schedule reliability. The capital cost of the TSM2 is estimated at \$47 million compared to the no build, and the operating cost of the TSM2 is predicted to increase by 1/3. The operating costs of the streetcar are projected to be 15% higher than the TSM2 alternative, and the capital cost almost 5 times as much. The TSM 2 option adds over 8,000 daily riders, compared to the base case, at a total investment of \$51 million, an investment of about \$1800 per daily rider. In contrast, the

¹ Alternatives are described in "Columbia Pike Transit Initiative Alternatives Analysis/Environmental Assessment – Volume II, p3-4– 3-11

streetcar alternative requires an additional investment of almost \$200 million over the TSM2, but carries only 1,600 more riders, an incremental cost of \$123,000 per daily rider.²

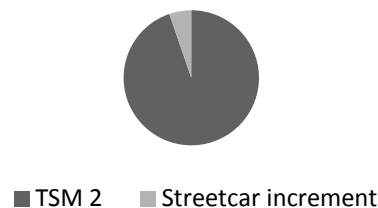
Capacity – The most essential requirement for new transit is significant expansion of transit capacity to accommodate planned development expected and growth in the existing transit market. The TSM2 alternative expands capacity by 34%, and the streetcar adds a modest 5 ½% more.

Despite the study findings that both appear to meet the needs of the year 2030, the

Locally Preferred Alternative report states that “the Streetcar Build Alternative could add significant passenger capacity with little increase in operating costs by replacing buses with higher-capacity streetcar vehicles, and in the future, capacity could be increased further—again with little increase in operating costs—through the use of larger-format vehicles or multiple-car consists.”³ That report does not mention that the capacity of the TSM2 alternative could be significantly expanded by replacing 10 standard buses with more articulated buses.

Speeds – Both alternatives reduce the peak hour travel time along the entire route between Skyline and Pentagon City by 3 minutes, TSM2 a little less and the streetcar slightly more. Since both vehicles operate in mixed traffic, it is not clear why there should be any time difference.⁴ In both cases, transit speeds in the corridor increase from about 10 MPH to 13 MPH, a relatively large improvement, even if much slower than driving.

Capacity increase ~ 2016



Comparing time savings ~ 2030



Ridership changes - 2030



Ridership – The computer models predict ridership based on time and cost comparisons. Average weekday ridership in the corridor is forecast to expand by 41% under the TSM2 alternative in 2016, and 40% by 2030 compared to the base case. Compared to the latest data for 2011, the growth is even greater, a gain of 14,000

² Columbia Pike Transit Initiative: Alternatives Analysis / Environmental Assessment: Executive Summary, p 2. Charts created by author from that report.

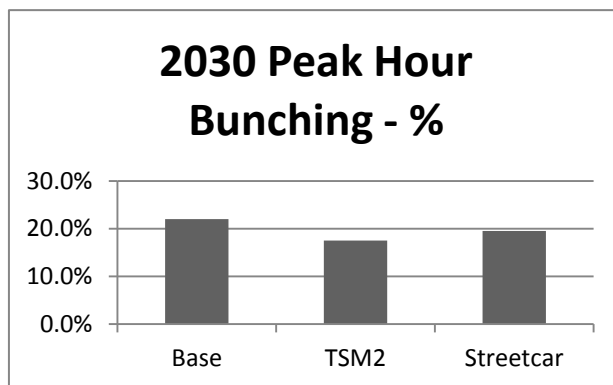
³ Columbia Pike Transit Initiative- LPA Report July 16, 2012 Page 10

⁴ If anything, streetcars would be more subject to delay since they would not be able to move around an accident or obstruction in the street.

daily riders, 93% above 2011 levels. This is more than double the 6,000 daily ridership increase between 2003, when the Pike Ride was introduced, and 2011. Ridership in the streetcar alternative is forecast to expand by an additional 4 ½ % in 2016, and 5.5% by 2030. The difference is due, not to time differences, since the assumptions for both alternatives are virtually identical, but to a 5% “mode specific” adjustment allowed by the Federal Transit Administration forecasts to account for the greater appeal of a streetcar, especially in places where travelers have not experienced rail transit.⁵

Reliability – Another edge claimed for streetcars is that they do not have the problem of bunching which occurs on major bus routes

when one bus slows down because of boarding and traffic delays, while the following bus catches up and they run as a two, or more, bus platoon, half as frequently as the published schedule. Of course, streetcars running on frequent routes are subject to the same problem, perhaps more so because in mixed traffic any obstruction can cause a backlog until cleared. Because of the improvements in passenger loading and signal



priorities, the likelihood of both TSM2 and streetcar alternatives to avoid bunching improves by 2016, with the streetcar reliability slightly better. By 2030, however, the reliability of the TSM2 alternative improves even more, better than the streetcar reliability, as shown in the chart. This contradicts the statement in the report that adding more buses, as in the TSM2 alternative, will not solve the problem, while a streetcar would, “because of the already high service frequency, adding more buses to the corridor would lead to more bus bunching and delays to passengers. Rather than adding more buses, increasing the capacity of the transit vehicle would contribute to increased service reliability and less bus bunching occurrences”.⁶ The results of the forecasts contradict this claim, since the 2030 data shows that the TSM2 alternative is more reliable. Moreover, bus capacity can be expanded by replacing more standard buses with articulated buses, an option not studied in the reports.

Reduced Driving, improved Regional Connectivity. In addition to providing for the expected growth in transit, a goal of the transit plan is to decrease local automobile trips. Since a 2010 survey showed that a quarter of all trips taken by Columbia Pike residents are less than two miles, and that “given the speed and operation in mixed-traffic, streetcar systems are intended to support short, local trips and to connect various activity centers”, it was hoped that there would be some reduction in automobile travel.⁷ The forecasts indicate that any changes are

⁵ Columbia Pike Transit Initiative: LPA Report July 16, 2012 Page 10. In cities proposing major new light rail systems such as Houston or Norfolk, a “rail bonus” may be necessary to account for the appeal of rail compared to existing transit, perceived by most non users as unattractive buses serving poor people. It is doubtful that Arlington residents are as unsophisticated when comparing transit options.

⁶ Columbia Pike Transit Initiative: Alternatives Analysis / Environmental Assessment:Executive Summary, p 2

⁷ Columbia Pike Transit Initiative: LPA Report July 16, 2012 Page 10

likely to be miniscule, and most of them will have been achieved by the TSM2 alternative. The share of daily trips by transit in 2030 is projected to increase from 12.9% in the no build alternative to 13.23% under the TSM, and 13.31 with the streetcar, a difference probably smaller than the forecasting error of the models.⁸

A greater concern when it comes to differentiating alternatives is the regional connectivity of this corridor, anchored by two, high-density activity centers: Skyline and Pentagon City. Either transit option serves trips well if they begin and end within the 5 mile corridor. However, Skyline is a terminus, and is well served for corridor residents going to Skyline to work or vice versa. For those continuing on into (or from) Fairfax or other parts of Northern Virginia and Washington, a transfer will be required from the streetcar. If similar BRT projects in Fairfax and Alexandria are completed, however, users of the TSM2 alternative may have a direct, no transfer trip.

Costs While the transportation performance of the two transit options tested is quite close, the costs of the streetcar option are vastly higher, currently estimated at about

Capital costs - 2030



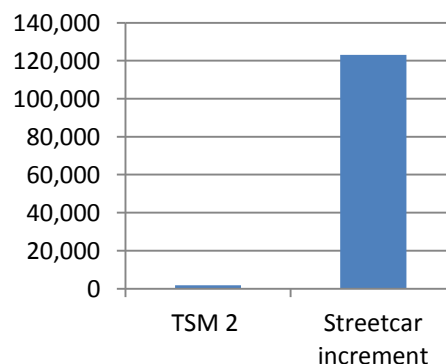
Operating Costs - 2030



\$250 million in 2016 dollars, almost \$200 million more than the \$53 million estimate for the TSM2 alternative. In addition, the operating and maintenance costs of the streetcar are also higher, ranging from \$3 million more annually in 2011 dollars, up to \$7 million annually in 2016 dollars. Not only can the TSM be delivered for a fraction of the cost of the streetcar, it will be cheaper to operate.

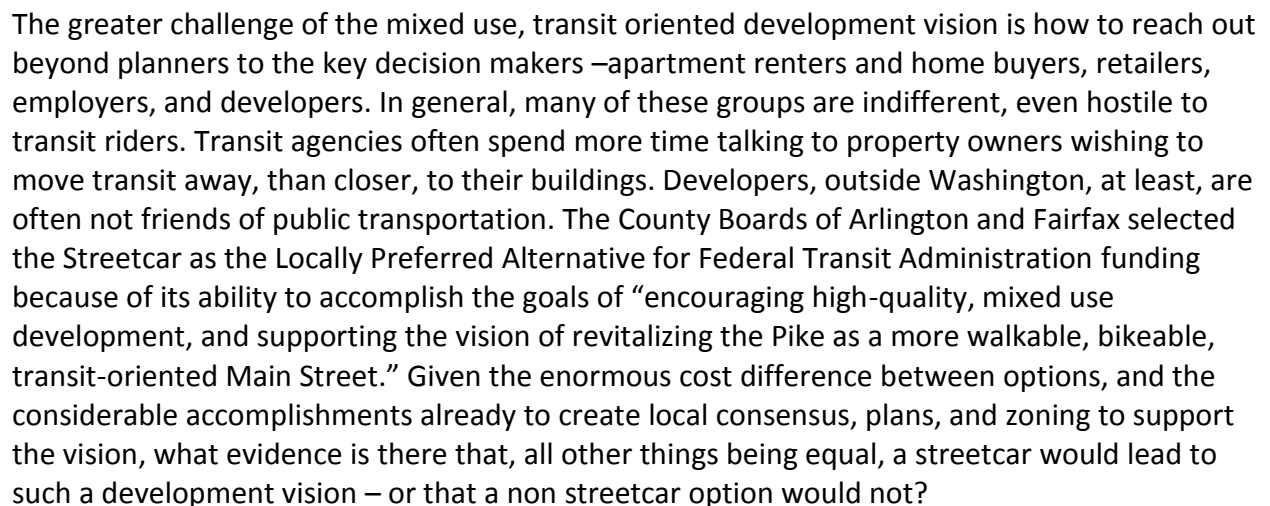
As indicated above, most of the 30,500 annual ridership estimated for the streetcar will also be carried by the TSM2 option, for a fraction of the cost, about \$53 million. The capital cost of the TSM2 option per additional rider, *over and above those expected in the base case*, comes to about \$1800 by 2030. The streetcar option would cost almost \$200 million more, but carry only an additional 1,600 daily riders, a staggering investment of \$123,000 for each new rider.

Capital cost/added rider ~ 2030



⁸ Columbia Pike Transit Initiative: Alternatives Analysis / Environmental Assessment: Executive Summary, p 6

The vision calls for a corridor “transformed from an auto-oriented to a pedestrian- and transit-oriented corridor to a “Main Street,” with small activity nodes with mixed-use centers. The Streetcar Alternative was recommended as the alternative that will address the transit needs of the community and achieve the counties’ vision of a transit-oriented and pedestrian oriented corridor.



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- Will residents use transit? The preferred alternative report, attempting to make the case that riders will use a streetcar, (but presumably not a bus) cites the experience in other cities. – Portland, Phoenix, and Hampton Roads.⁹ And this is already the busiest bus corridor in Virginia. Using other communities as models for transit riding in Arlington is odd, since Arlington is recognized among many experts as the best in the US in improving transit and creating transit oriented development (TOD), even before the term was in vogue. It is more likely that residents of Columbia Pike will embrace this premium bus option, which is so much improved over today, even more than forecast.
- Is a streetcar necessary to create a livable, walkable development? To demonstrate the ability of a streetcar system to support and enhance both counties' efforts to encourage walking trips, create a sense of place, and make more areas accessible to pedestrians, a case study of Portland is offered, again, an intersection behind the nationally respected Powell's Bookstore, which, after the Portland Streetcar arrived at a stop at 11th and Couch, *and after the adjacent blocks were redeveloped with transit-oriented development* (Italics added), the pedestrian count total was 938 per hour."¹⁰ Arlington's own efforts at enhancing the corridor with some of the new developments underway have no doubt already increased pedestrian traffic.
- Will developers participate in a bus only development corridor? Successful implementation of corridor plans requires an engaged real estate community, and it is an insult to Arlington developers to doubt their willingness to participate in such a well established plan without a streetcar. On the other hand, it may also require some education, even in Arlington, where two other corridors are recognized as national models of successful real estate development and placemaking. Joseph Calabrese, the General Manager of Cleveland Rapid Transit, speaking about that city's highly successful Bus Rapid transit project in transforming a deteriorating urban corridor, pointed out that "many developers are not friends of transit – they do not want a bus stop near their store". <http://www.youtube.com/watch?v=kF6EF3kOGQE> . Cleveland is the location of one of the nation's most successful new BRT projects in promoting economic development along a deteriorating urban corridor, Euclid Avenue, which links the region's two most important activity centers, University Circle and the downtown. The 6.8 mile BRT which opened in 2008 has already resulted in \$6 billion in new investment and redevelopment.¹¹

Better Development Models for Arlington- with or without transit

There are some excellent models for redeveloping Columbia Pike, nationally and locally. They include mixed use developments without transit, as well as some served by heavy rail stations,

⁹ Columbia Pike Transit Initiative: LPA Report July 16, 2012 Page 8

¹⁰ Columbia Pike Transit Initiative: LPA Report July 16, 2012 Page 9

¹¹ Jason Hellendrung, HealthLine Drives Growth in Cleveland, Urban Land magazine, July 2012

where the rail was not enough. Finally, it is important to listen to current and future Arlington developers to learn how to leverage a major transit investment into a development vision.

TOD without transit - Some of the most nationally recognized new urbanist developments, such as Belmar in Lakewood, Colorado and Santana Row in San Jose, exemplify the best in livable, walkable developments - mixed uses, high density, good pedestrian connections, and shared parking, but do not have strong connections to the regions' light rail systems. They exemplify a common theme around the US; many of the most prominent mixed use projects are really TOD without transit.¹² And of course, not far from the Columbia Pike corridor is the enormously vibrant pedestrian oriented community of Shirlington, transformed from a dying, auto oriented mall through good planning and excellent development, with only minimal bus service.

Redeveloping major transit stations – Just because an area or corridor is served by transit does not guarantee it will be redeveloped. Some of the better examples are close to home – the plans for Tysons, the Rockville Pike corridor, and of course the Rosslyn Ballston Corridor. The transformation of Tysons involves undoing all of the suburban policies that created it – the lack of housing, the lack of connectivity, and the low density. Rockville Pike will also involve creating a street grid, converting vast areas of surface parking, and establishing places to walk and enjoy. The Rosslyn Ballston story is one of over thirty years of smart growth, even before it was so called, and carefully redeveloping a declining urban corridor around a new transit line.

What do the developers say? A survey of Arlington developers was conducted as part of the Return on Investment study to attempt to get at some of their opinions on transit and real estate. There was some appeal to the enhanced transit corridor. Of the 22 responses, sixty 60 percent said that higher quality transit, like a streetcar, was very important or important in choosing to develop along the corridor, and 40 percent reported that they were more likely to develop along the corridor as opposed to other places in Fairfax or Arlington without rail service.

When asked for specifics about what policies would help facilitate development, however, what came through strongly were the importance of real estate basics. The developers overwhelmingly agreed that density bonus (60.9 %) and upzoning (56.5 %) were very important. Low interest loans, an expedited review process, and assistance with land assembly were all deemed important (34.8 %, 45.8 %, and 30.4 % respectively).¹³ Moreover, while the development community understood that implementation of the Form Based Codes along Columbia Pike could yield higher densities, the incremental addition was not sufficient for them to build to a scale that would allow them to realize the full potential created by the streetcar.¹⁴ This is clearly a potential impediment that must be addressed, regardless of the type of transit developed. The survey of Arlington developers reinforces the importance of real estate basics, and the need for planning staff to engage the needs of developers in successfully implementing

¹² Dunphy, TOD without transit, Urban Land magazine, August 2007

¹³ COLUMBIA PIKE TRANSIT INITIATIVE Return on Investment Study July 2012, p. A-32

¹⁴ COLUMBIA PIKE TRANSIT INITIATIVE Return on Investment Study July 2012, p. 6-1

the Columbia Pike vision, rather than assuming that a streetcar alone will lead to success. Arlington developers have demonstrated an ability to create cutting edge mixed use projects, when given a chance.

Conclusion

This review of transportation studies recommending a streetcar option for Arlington and Fairfax County's portion of Columbia Pike has concentrated on two principal goals of the project's ability to support the vision for redevelopment of Columbia Pike: 1) improving transit and expanding transit capacity, and 2) achieve the counties' vision of a transit-oriented and pedestrian oriented corridor. In addition, the high cost of the streetcar option is examined compared to its limited marginal contribution to these two goals.

Improving transit and expanding transit capacity - According to the counties own corridor studies, the performance of a non streetcar, premium bus option known by the arcane description of TSM2 would have transportation performance characteristics very similar to that of the streetcar, especially the crucial measures of speed, capacity and reliability, and would do so at a fraction of the investment needed for a streetcar, with lower operating costs. Neither would make much of a dent in driving, but the terminus at Skyline might be bypassed for travelers destined further in Fairfax county, if a planned BRT network is completed there. The argument is stated that one cannot serve the growth with buses alone, but is contradicted the data on bunching, where the TSM2 outperforms the streetcar in 2030. Another argument is made that if greater capacity is needed in the future, beyond 2030, the streetcar capacity can be expanded cheaply by adding multiple vehicles. No actual models of this expansion were reported, and no mention is made of adding larger vehicles for the TSM2 alternative, which would accomplish the same goal.

These are the transportation basics needed to advance the vision for redevelopment. In addition to the basics, this new state of the art service should create customer appeal, and even excitement, through attractive vehicles, branding, information, and passenger amenities, perhaps even attracting additional ridership above that predicted.

Advancing the vision of a transit-oriented and pedestrian oriented corridor – If the transportation assessment represents the hard side of the analysis, based on extensive data and computer models, which alternative, if either, can help advance the development vision is the “soft side” of this study. No theories are tested or data calculated, merely an array of examples from other communities. If these are comparable examples, they do not advance the case very well. Phoenix and Hampton Roads hardly seem like useful role models for Arlington, and are served by light rail, not streetcars. Portland is the darling of planners, but Arlingtonians use transit three times as much, and the Portland streetcar runs only every 14 minutes, less than 1/5 the frequency of Columbia Pike service today. Transforming an existing corridor requires the kind of visionary planning and consistent land use policies proposed to redevelop Tysons (with the coming of the Silver Line), Rockville Pike (where Metro and suburban sprawl

coexist today), and of course the nationally recognized success of the Rosslyn Ballston corridor. Whatever transit option is selected, it will be essential for Arlington and Fairfax Counties to address the real estate basics and land use policies necessary to gain the active support of key stakeholders, especially developers and property owners. This will require delivering public commitments for transit, streetscapes, parks, and executing on plans, the “blocking and tackling” on planning basics for which Arlington has proven so adept elsewhere in the county. Without such basics, transit projects in other places have failed to deliver desired changes in development patterns. With such basics, vibrant mixed use, walkable communities have been successful, even without transit.

It appears that either the premium bus or the streetcar alternatives can deliver the needed transit expansion and support the redevelopment vision. The premium bus option can do so for a fraction of the cost, with lower operating costs. Moreover, it can be implemented more quickly, and without having to deal with federal regulations. A side benefit is that such an alternative could connect with proposed BRT projects in Fairfax and Alexandria, improving access to and from the Columbia Pike corridor, and making it even more attractive for new development.

About the Author

Robert Dunphy is an Arlington resident who serves as Arlington’s representative to the Northern Virginia Transportation Authority’s Technical Advisory Committee, and was a member of the Arlington-East Falls Church Metro Planning Committee. Professionally, he is a transportation consultant and instructor in Georgetown University’s Professional Real Estate program. Previously, he was a Senior Resident Fellow for Transportation and Infrastructure at the Urban Land Institute, a nonprofit planning and real estate research institute. He has assisted the Fairfax County Department of Transportation in the review of Tysons redevelopment plans, and served on the team advising the Federal Transit Administration on land use and economic development guidelines for evaluating new transit projects.